NON-PUBLIC?: N
ACCESSION #: 8908280005
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Grand Gulf Nuclear Station - Unit 1 PAGE: 1 OF 04

DOCKET NUMBER: 05000416

TITLE: Reactor Scram Caused by Lightning Strike
EVENT DATE: 07/22/89 LER #: 89-010-00 REPORT DATE: 08/21/89

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Ronald Byrd / Licensing Engineer TELEPHONE: (601) 437-2182

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On July 22, 1989, a severe electrical storm passed over Grand Gulf Nuclear Station. During the storm, the reactor automatically scrammed due to a high neutron flux signal on the Average Power Range Monitors (APRMs). Additionally, a spike to the Reactor Core Isolation Cooling (RCIC) system logic caused RCIC to automatically actuate and inject into the reactor vessel. Reactor water level decreased to -15 inches and was raised to the level 8 high level trip (+53.5 inches) in approximately 2 minutes.

A channel check of APRM indications was performed during plant restart on July 23, 1989 to confirm proper response. No abnormalities were observed. System Energy requisitioned a specialist in lightning protection to perform a plant survey and study of the existing plant lightning protection system. The contractor has submitted proposals to provide lightning dissipation arrays on vulnerable structures. System Energy is presently evaluating implementation methods and constructing a schedule for implementation. Current progress indicates that implementation will likely be completed by December 31, 1989. In any case, implementation will be completed no later than the startup from the fourth refueling outage (RF04).

END OF ABSTRACT

A. Reportable Occurrence

On July 22, 1989, the reactor automatically scrammed due to a lightning induced spike on the Average Power Range Monitors (APRMs). This Reactor Protection System (RPS) actuation is reported pursuant to 10CFR50.73(a)(2) (iv).

B. Initial Conditions

The plant was operating at approximately 100 percent power at the time of occurrence.

C. Description of Occurrence

On July 22, 1989, a severe electrical storm passed over Grand Gulf Nuclear Station. At 1723 during the storm, the reactor automatically scrammed due to a high neutron flux signal on the APRMs (EIIS code: IG). All APRM channel upscale alarms annunciated and immediately cleared. Evaluation of the event revealed that the APRM high neutron flux signal lasted less than one-tenth of a second. Additionally, a spike to the Reactor Core Isolation Cooling (RCIC) system (EIIS code: BN) logic, simulated a low water level signal and caused RCIC to automatically actuate.

Following the scram, the reactor water level decreased to approximately -15 inches but was raised to level 8 (+53.5 inches) at 1725 by the RCIC injection. Prior to reaching level 8, operators decreased RCIC injection flow and secured reactor feed pump "B". When level 8 was reached, the RCIC injection valve automatically closed and the "A" Reactor Feed Pump Turbine tripped as designed. The reactor water level decreased below level 8 at 1731. Reactor Feed Pump "A" was restarted at 1734.

D. Apparent Cause

The RPS actuation and subsequent reactor scram were caused by an initiation signal from 7 of 8 APRM channels. The trip function of the APRMs is set to occur when core thermal power reaches 118 percent instantaneously. Review of computer traces indicate that channel B spiked to approximately 118 percent. Considering the accuracy of the

traces, it is concluded that the trip setpoint for channel B was not reached.

The approximate peak indicated flux for each channel is as follows:

APRM Channel	Peak Indicated Flux
A	126%
B	118%
C	126%
D	140%
E	123%
F	123%
G	134%
H	140%

The Post Trip Analysis concluded that the cause of the instrumentation signal spikes was an induced voltage and/or ground potential spike caused by lightning activity at the site.

A previous similar event was reported in LER 88-012. The cause of the APRM spikes for that event was determined to be a fence grounding strap that was routed in close proximity to conduit containing Division 3 and 4 APRM signal cables. The grounding straps for the fence were relocated and evaluations for final resolution continued. Final resolution had not been completed at the time of the July 22, 1989 occurrence.

E. Supplemental Corrective Actions

A channel check of APRM indications was performed during plant restart on July 23, 1989 to confirm proper response. No abnormalities were observed.

The fence located on the roof of the Control Building and Turbine Building was dismantled as a precautionary measure. An inspection of the fence revealed no evidence of it having been struck by lightning.

System Energy requisitioned a specialist in lightning protection to perform a plant survey and study of the existing plant lightning protection system. The contractor has submitted proposals to provide lightning dissipation arrays on vulnerable structures. System Energy is presently evaluating implementation methods and constructing a

schedule for implementation. Current progress indicates that implementation will likely be completed by December 31, 1989. In any case, implementation will be completed no later than the startup from the fourth refueling outage (RF04).

PCOM LER 89-010-00 - 3

TEXT PAGE 4 OF 04

F. Safety Assessment

The Post Trip Analysis confirmed that all safety systems functioned properly and that plant response to these automatic actions was as expected. RPS response times were satisfactory when compared to expected or required times. Reactor water level remained at least 151 inches above the top of active fuel during the event. All Emergency Core Cooling Systems were operable but were not required to be automatically or manually initiated.

PCOM LER 89-010-00 - 4

ATTACHMENT 1 TO 8908280005 PAGE 1 OF 1

SYSTEM ENERGY RESOURCES, INC
A Middle South Utilities Company

WILLIAM T. COTTLE August 21, 1989
Vice President
Nuclear Operations

U.S. Nuclear Regulatory Commission
Mail Station P1-137
Washington, D.C. 20555

Attention: Document Control Desk

Gentlemen:
SUBJECT: Grand Gulf Nuclear Station
Unit 1
Docket No. 50-416
License No. NPF-29
Reactor Scram Caused by
Lightning Strike
LER 89-010-00
AECM-89/0155

Attached is Licensee Event Report (LER) 89-010-00 which is an interim report.

Yours truly,

WTC:cg
Attachment

cc: Mr. D. C. Hintz (w/a)
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